NOKIA

37H2

MODEL

SERVICE MANUAL

MAIN BOARD

CR⁻ BOARD

HANDSET BOARD

CT20 MODEL ONLY

CAUTION LIVE AREA

CIRCUIT SYMBOLS		
CAPACITOR		RESISTOR
CERAMIC	MYLAR	CARBON FILM
NON-POLAR	METALLIZED POLYESTER	CEMENT
ELECTROLYTIC	POLYESTER FILM	METER OXIDE
N.P.O	POLYPROPYLENE	FUSEABLE
TANTALUM	METAL PAPER	CARBPN COMPOSITION

NOTE:
1. ALL CAPACITORS ARE IN uF UNLESS OTHERWISE NOTED.
   ALL CAPACITORS ARE 50V UNLESS OTHERWISE NOTED.
2. ALL RESISTORS ARE IN OHM 1/4 WATT UNLESS OTHERWISE NOTED.
3. ALL DIODES ARE IN 1N4148 UNLESS OTHERWISE NOTED.
4. ALL TRANSISTORS (NPN) ARE 2SC1815 UNLESS OTHERWISE NOTED.
   ALL TRANSISTORS (PNP) ARE 2SA1015 UNLESS OTHERWISE NOTED.
5. DC VOLTAGE ARE MEASURED FROM POINTS INDICATED TO THE CIRCUIT GROUND WITH A DIGITAL MULTIMETER TEST.
6. WAVEFORMS ARE TAKEN WITH SETTING CONTROLS TO A NORMAL CONDITIONS (COLOR PHILIPS PATTERN UHF).
7. THIS CIRCUIT DIAGRAM IS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.
8. ⚠ SAFETY CRITICAL DEVICE.

k COMPARISION TABEL OF THE DIFFERENT PARTS VALUE FOR 14" 20" 21" CHASSIS

LOCATION	14"	20"	21"	LOCATION	14"	20"	21"	LOCATION	14"	20"	21"
R283	27K	22K	22K	R403	18K	120K	120K	R621	5.6K	3.3K	3.3K
R285	12/2W	5.6/1W	3.6/1W	C449	4.7/16	4.7/16	3.3/16	R622	5.6K	3.3K	3.3K
L284	BARE WIRE	120uH	120uH	D402	1N4148	BARE WIRE	BARE WIRE	R807	0.33	1	.5
L285	BARE WIRE	120uH	120uH	R505	1K	2.2K	2.2K	R810	30K	30K	33K
C287	1000/25	2200/25	2200/25	R506	1.8K	3K	3K	R811	2.2/5W	3.3/5W	2.2/5W
C296	NIL	100/25	100/25	R507	1K	2.2K	2.2K	R815	1.2K	1.2K	1K
R381	5.6K	3.2K	3.3K	R508	1.8K	3K	3K	R818	20K	27K	24K
R382	5.6K	3.2K	3.3K	R509	1K	2.2K	2.2K	R822	18K	15K	5K
R383	5.6K	3.2K	3.3K	R510	1.8K	3K	3K	R852	150K	120K	100K
R402	27K	5K	5K	R620	5.6K	3.3K	3.3K	R853	68K	82K	120K

LOCATION	14"	20"	21"	LOCATION	14"	20"	21"	LOCATION	14"	20"	21"
R857	2.2	1.5	1.5	ZD804	3.9V	NIL	NIL	L301	0.82	1.5	1.5
R858	2.2K	2.4K	2.4K	L801	57uH	54u4	54u4	L302	1.5	BARE WIRE	BARE WIRE
R859	1.8K	1.2K	1.2K	T802	FCM-16A028A	FCM-20A016	FCM-21A004	L303			
R861	470	330	330	R933	0.33	0.22	0.22	L309			
R863	1K	1K	820	R937	0.68	0.47	0.47	R311	75	NIL	NIL
C805	820P/2KV	470P/2KV	470P/2KV	C932	4700P/500	2200P/500	2200P/500	R316	NIL	75	75
C806	5600P/1.8KV	6800P/1.6KV	5600P/1.6KV	C943	47/16	470/16	470/16				
C819	4.7/160	1/160	4.7/16C	C516	NIL	560P	560F				
C823	0.47/200	0.47/200	0.33/200	C518	56CP	NIL	NIL				
D810	NIL	IN4148	IN4148	C865	0.01/2K	NIL	NIL				

ALIGNMENT INSTRUCTION

I. Before Adjustment and Maintenance

A. Don't short any two soldering points or connect any component while TV set is power on.
B. Withdraw power plug before maintenance.
C. Safety components (⚠) in accordance with existing requlations. These components must be replaced only with original part.
D. Must warm up the set for 30 minutes or more and degauss CRT thoroughly with demagnetiser coil before alignment.

II. Equipment for Adjustment

a. Pattern Generator (PM5518/5418)
b. Digital Voltmeter (Inner Resistance ≃ 10MOhm)
c. High Voltage Meter
d. Sine Wave Signal Generator (Precision: 10KHz)
f. Demagnetiser
g. DC Regulated Power Supply
h. Oscilloscope
t. Ture RMS AC Digital voltmeter (min. Crest factor 5:1)

III. B+ Alignment

1. Receive standard colour bar signal.
2. Select the "RESET" embody on VIDEO MENU to set controls at normal condition.
3. Connect a digital voltmeter between of C811 and GND.
4. Adjust VR901 to get the voltage value at different mode as follow
   14" 110V ± 0.25V,
   20" 115V ± 0.25V,
   21" 110V ± 0.25V.
   (SEE ATTACHED CONVERSION TABLE OF DIFFERENT CRT FOR DIFFERENT VOLTAGE)

IV. ADJUSTMENT OF VIF VCO

1. Connect output lead of (38.9 ± 0.02MHz, 95-100dBuV without modulation), sine wave signal Generator to the PIF pin and GND of tuner.
2. Connect one channel of the oscilloscope which set DC-INPUT to the pin 41 of IC601, connect other channel of oscilloscope which set AC-INPUT to base of the Q202.
3. Adjust T201 to read out 2.5 ± 0.1V on the DC-settled channel and get stable line on the AC settled channel.

V. Adjustment of RF AGC

1. Receive RF signal (60-62dBuV) with PHILIPS pattern at VHF-HIGH BAND
2. Adjust RF AGC control (VR201) until noise is disappeared.

VI. SERVICE MODE

A service menu facilitates TV chassis alignment and repair in the field. Press the volume-up and volume-down buttons on the TV set front panel simultaneously above 2 seconds, the set will display the service mode menu on the screen.

NOTE: On the service mode the set can power on automatically and bypass the standby mode, it use for aging operation on mass production.
Two ways to switch back to normal TV reception, One is using clear button, and the another way is pressing and hold on program up or down on local set and then push main power switch to turn TV off and on.
The current channel number is displayed on the top left corner. The decimal value on the center of the second line is the parameter and the following is value. The Channel-up and Channel down buttons select parameters while Volume-up and Volume-down buttons adjust the current value of parameters.
When parameters are modified, the corresponding EEPROM locations are updated as displayed automatically.

REPLACE OF EEPROM: The MCU will automatic in itialization the EEPROM contents when the blank new EEPROM is changed.

1. Change of blank new EEPROM.
2. Connect the main supply.
3. Power ON tne main Switch.
4. Press the remote stand-by button or channel-up button on the front panel.
5. Wait 6 seconds and the TV will turn on automatically. (The MCU will blocked the TV set 6 seconds for EEPROM intialization).

The service mode OSD menu will displayed on screen. Adjust the parameter as requested.

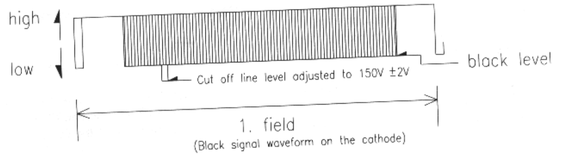
Parameter	Description	Device	Register	Minimum	Maximum
1	Red Gain	STV2112B/2116	3	0	63
2	Red cut-off (PAL)	STV2112B/2116	4	0	63
3	Green Gain	STV2112B/2116	5	0	63
4	Green cut-off (PAL)	STV2112B/2116	6	0	63
5	Blue Gain	STV2112B/2116	7	0	63
6	Horizontal position	STV2112B/2116	11	0	63
7	Vertical position	STV2112B/2116	13	0	7
8	Vertical amplitude (50Hz)	STV2112B/2116	12	0	63
9	Vertical amplitude (60Hz)	STV2112B/2116	12	0	63
12	Red cut-off (SECAM)	STV2112B/2116	4	0	63
13	Green cut-off (SECAM)	STV2112B/2116	6	0	63
22	NTSC Horizontal position	STV2112B/2116	11	0	63
23	NTSC vertical position	STV2112B/2116	13	0	7
24	OSD vertical position	STV2112B/2116		20	46
25	OSD horizontal position	STV2112B/2116		0	32

The following adjust ments are in the service mode

A. Adjustment For White Balance

1. Receive Black-White pattern RF signal.
2. Select "RESET" in VIDEO MENU to set Contrast and Brightness at normal position.
3. Enter service mode. (Press the volume up and down button on the front panel simultaneously).
4. Set parameters of 2,4,12,13 to "32" and parameters, 1,3,5 to "63"
5. SCREEN ADJUSTMENT.
   Receive the PAL black pattern.
   Find out the highest cut off line level between the pin 9. 12. 15 of IC501 and connect the probe of oscilloscope on the highest cathode.

(a) For production use only
Adjust SCREEN potentiometer to have 150V ± 2V on the cut-off lines (line 23-24-25 in 50Hz).



(b) For service use only
Adjust SCREEN potentiometer to have 160V +/-2V using the bleak level (for test line not available).

6. Receive the pattern "Red" plus "colour bar" from pattern generator PM5518 (or PM15418).
7. Change the parameter 5 to value "45" and parameters 1 and 3 to value "32".
8. Adjust the values of G-cutoff and R-cutoff and R-Gain, G-Gain separately to make the dark (5-10 cd/m^2) and bright (100 cd/m^2) area to white.
9. Repeat above step 7, until both bright area and dark area meet white balance.
   NOTE: x=0.295±0.015, y=0.300±0.015 (for NOKIA series only).

B. HORIZONTAL AND VERTICAL POSITION ADJUSTMENT

1. Receive the Philips pattern signal (PAL or SECAM).
2. Select the parameter 6 "Horizontal position" and adjust the horizontal position of the pattern for center.
3. Select the parameter 7 "Vertical position" and adjust the vertical position of pattern for center.
4. Receive the Philips pattern signal (NTSC).
5. Select the parameter 22 "Horizontal position" and adjust the horizontal position of the pattern for center.
6. Select the parameter 23 "Vertical position" and adjust the vertical position of pattern for center.

C. VERTICAL AMPLITUDE ADJUSTMENT

1. Receive the Philips pattern signal (PAL or SECAM).
2. Change the parameter 8 "Vertical amplitude" to slightly overscan the screen.
3. Receive the pattern signal of NTSC.
4. Change the parameter 9 "Vertical amplitude (NTSC)" to slightly overscan the screen.

D. OSD POSITION ADJUSTMENT

1. Change the parameter 24 and 25 "OSD Vertical position and OSD Horizontal position" to make the arrows appear at four corner and at the center of Hor. And vertical position.

VII. Adjust for FOCUS

1. Select the "RESET" in the VIDEO MENU to set controls at normal position.
2. Adjust knob 'FOCUS' on FBT (DST) to make the picture on the screen to be the most distinct.

VIII. TEST Heater Voltage

The range of Heater Voltage must be 6~6.5Vrms when the pattern on the screen from full white change to full dark.
Note: Use true RMS AC Digital Voltmeter (min. Crest factor 5:1)

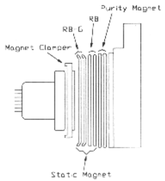
IX. COLOUR PURITY ADJUSTMENT

BEFORE ANY ADJUSTMENTS DESCRIBED BELOW ARE ATTEMPTED, V-HIGH, B+ VOLTAGE AND FOCUSING ADJUSTMENT MUST BE COMPLETED.

1. Place the TV receiver facing NORTH or SOUTH.
2. Plug in TV receiver and turn it on.
3. Operate the TV receiver over 30 minutes.
4. Fully degauss the TV receiver by using the external degaussing coil.
5. Receive a "crosshatch plus circle" pattern and adjust the static convergence control roughly.
6. Loose the clamp screw of the deflection yoke and pull the deflection yoke towards you.
7. Adjust the purity magnets so that green field is obtained at the center of the screen.
8. Slowly push the deflection yoke toward CRT and set it where a uniform green field is obtained.
9. Tighten the clamp screw of the deflection yoke.

X. CONVERGENCE ADJUSTMENT

1. Receive a dotted pattern.
2. Unfix the convergence magnet clamper and align red with blue dots at the center of the screen by rotating (R,B) static convergence magnets.
3. Align Red/Blue with green dots at the center of the screen by rotating (RB-G) static convergence magnet.
4. Fix the convergence magnets by turning the clamper.
5. Remove the DY wedges and slightly tilt the deflection yoke horizontally and vertically to obtain the good overall convergence.
6. Fix the deflection yoke by wedges.
7. If purity error is found, follow "PURITY ADJUSTMENT" instructions.



XI. APS (Automatic Programming System) Function SETUP

1. Power on the TV set.
2. Press the APS: Button of the remote handset. The TV set will switch to standby mode automatically. The APS is already set.
3. Switch off the Main Switch.

NOTE: The APS switch is special made by the service center which is not included at the standard user remote control.
The TV set will display "APS ACTIVE" during the next time turn on. It will warm up around 1 minute and then search all the program. The location of the APS button is located at keypad number 22.